

NASA TECH BRIEF

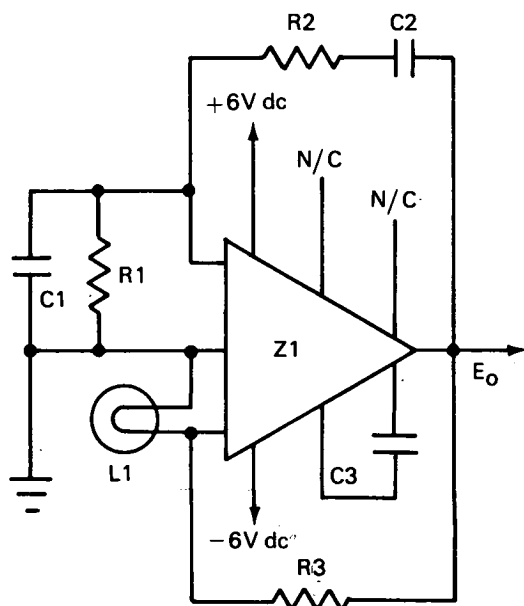
Manned Spacecraft Center



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Wein Bridge Oscillator Circuit

An oscillator circuit designed with a minimum number of components provides stable outputs of 2 to 8 volts at frequencies of .001 to 100 kHz. Prior techniques required at least three basic stages,



and do not exhibit the low power consumption, portability, simplicity, and drive capability achieved with this design. The oscillator, due to its low cost and high performance, has application as a loudspeaker tester and an audible alarm (when connected to a loudspeaker), as well as in laboratory and field test generators, and in timing generators.

The design provides a stable, low distortion Wein bridge oscillator-driver capable of driving load impedances of less than 10 ohms as well as large capacitive loads. In the circuit (see fig.), R1

was selected to equal the typical input impedance of the amplifier, and R2 to equal R1 shunted by the amplifier input impedance. C1 and C2 are equal and provide the reactive components in a positive feedback configuration. C3 compensates the amplifier, while L1 provides the necessary automatic gain control function. R3 provides the required negative feedback and also the limited control of the output amplitude. A slight amount of crossover distortion is exhibited at the higher frequencies due to the amplifier output stage. The frequency of oscillation is expressed by the formula:

$$\frac{1}{2\pi R1C1} = \frac{1}{2\pi R2C2}$$

The circuit has been implemented and tested, and it meets the above criteria, exhibiting very good power supply immunity and high lamp-life expectancy.

Notes:

1. This circuit can be implemented inexpensively, and performance is comparable to circuits several times as expensive. A complete test generator can be packaged into small volume and will consume only about 100 mW of power plus that required to drive the load.
2. Two critical elements in the circuit are: the amplifier (Z1, MC1454) which makes this unique circuit and associated performance possible; and the 1 amp (L1) element which must be a very low voltage, low current device for proper circuit operation.
3. Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code JM7
Houston, Texas 77058
Reference: B71-10089

(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

Source: Phillip C. Lipoma of
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